Patient Monitor

MINDRAY CPM 12

ABOUT

The Mindray cPM 12 is a versatile and advanced patient monitor designed to provide comprehensive monitoring for various clinical environments. Its user-friendly interface and robust feature set make it an ideal choice for critical care, emergency, and perioperative settings.

FEATURES

High resolution 8” and 12” touchscreen displays

Displays up to 7 waveforms

Standard features include 3- or 5-lead ECG, Masimo SET® SpO2, NIBP, respiration, temperature, integrated recorder

Optional Nellcor® OxiMax® SpO2 available

Arrhythmia analysis with atrial fibrillation detection and QT/QTc monitoring

Additional module parameter options include:

- Sidestream CO2
- 2 IBP + CO + Sidestream CO2
- 2 IBP + CO + Microstream® CO2
- Multi-gas + 2 IBP + CO (cPM12 only)

Extensive data storage capability for trend data, alarms, events, NIBP measurements and up to 48 hours of full disclosure

Integrated HL7 and serial DIAP protocol interfaces

Defibrillator synchronization

Ergonomic carrying handle, and multiple mounting solutions

Mindray ePM 12M

SPECIFICATIONS

DIMENSIONS

Height: 10.8 in (27.4 cm)

Width: 12.6 in (31.8 cm)

Depth: 5.1 in (12.8 cm)

Weight: 10 lb (4.5 kg)

AC POWER

Line voltage: 100 to 240 VAC (±10%)

Input current: 1.3 to 0.5 A

Frequency: 50/60 Hz (± 3 Hz)

BATTERY

Battery type: Chargeable Lithium-Ion, 11.1DVC, 4.5 Ah

Run Time

- One Battery: ≥ 4 hours
- Two Batteries: ≥ 8 hours

Charge time

- ≤ 3h to 90% and ≥ 4h when the monitor is off
- ≤ 8h to 90% and ≥ 12h when the monitor is on

DISPLAY

Screen Size: 12.1”

Screen Type: Color TFT LCD

Resolution: 800x600 pixels

Number of waveform channels : Maximum 3

RECORDER

Method: Thermal dot array

Paper width: 50 mm±1 mm

Paper Speed: 25 mm/s or 50 mm/s with accuracy within ±5%

Number of waveform channels : Maximum 3

MONITOR INTERFACE

Power: 1 AC power input connector

Wired network: 1 RJ45 connector, 100 Base-TX, IEEE 802.3

USB: 2 connectors, USB 2.0

Equipotential Grounding Terminal: 1

Multifunctional connector: 1

VGA connector: 1

DATA STORAGE

Trends

- 120 hours, at 1 min resolution
- Mid-length trends: 4 hours, at 5 s resolution
- Minitrends: 1 hour, at 1 s resolution

Parameter alarms: 100 alarms and manual events and related parameter waveforms. The waveform recording length can be 8s, 16s, or 32s.

Arrh. events: 100 arrhythmia events and relate waveforms and parameters. The waveform recording length can be 8s, 16s, or 32s.

NIBP measurements: 1000 sets

Full-disclosure waveforms: 48 hours at maximum. The specific storage time depends on the waveforms stored and the number of stored waveforms.

ECG

Standards: Meet standards of EC11, EC13, EN60601-2-27/IEC60601-2-27 and IEC60601-2-25

Lead set

- 3-lead: I, II, III
- 5-lead: I, II, III, aVR, aVL, aVF, V

ECG standard: AHA, IEC

Display sensitivity

- 1.25 mm/mV (X0.125), 2.5 mm/mV (X0.25), 5 mm/mV (X0.5), 10 mm/mV (X1), 20 mm/mV (X2), 40 mm/mV (X4)
- Accuracy: ±5%

Sweep speed

- 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s,
- Accuracy: ±10%

Bandwidth (-3dB)

- Diagnostic mode: 0.05 to 150 Hz
- Monitor mode: 0.5 to 40 Hz
- Surgical mode: 1 to 20 Hz

Common mode rejection ratio

- Diagnostic mode: >90 dB
- Monitor mode: >105 dB
- Surgical mode: >105 dB

Notch filter: 50/60 Hz

Differential input impedance: ≥5 MΩ

Input signal range: ±8 mV (peak-to-peak value)

Electrode offset potential tolerance: ±500 mV

Lead-off detection current

- Measuring electrode: <0.1 μA
- Drive electrode: <1 μA

Input offset current

- Measuring electrode: ≤0.1 μA
- Drive electrode: ≤1 μA

Baseline recovery time: <5 s (after defibrillation)

Patient leakage current: <10 uA

Calibration signal

- 1mV (peak-to-peak value)
- Accuracy: ±5%

ESU protection

- Cut mode: 300 W
- Coagulate mode: 100 W
- Recovery time: ≤10 s

ESU noise suppression: Compared with ECG baseline, the noise of peak to peak value ≤2 mV.

PACE PULSE

Pace pulse markers

- Amplitude: ±2 to ±700 mV
- Width: 0.1 to 2 ms
- Rise time: 10 to 100 μs

Pace pulse rejection

- Amplitude: ±2 to ±700 mV
- Width: 0.1 to 2 ms
- Rise time: 10 to 100 μs

Pacer pulse detector rejection of fast ECG signals: 10V/s RTI

SPO_2

SpO2 High: (low limit + 2) to 100

SpO2 Low

- **Masimo:** Desat to (high limit – 2)
- **Nellcor:** Desat or20 (whichever is greater) to (high limit – 2)

Desat 0 to (high limit – 2)

HR

Measurement range

- Neonate: 15 to 350 bpm
- Pediatric: 15 to 350 bpm
- Adult: 15 to 300 bpm

Resolution: 1 bpm

Accuracy: ±1 bpm or ±1%, whichever is greater

Sensitivity: 200μV (lead II)

Minimum QRS detection threshold

- Adult and pediatric: 0.16 to 0.48 mV
- Neonate: 0.12 to 0.40 mV

Measurement range

- QT: 200 to 800 ms
- QTc: 200 to 800 ms
- QT-HR: 15 to 150 bpm for adult, 15 to 180 bpm for pediatric and neonate

Accuracy: QT ± 30 ms

Resolution

- QT: 4 ms
- QTc: 1 ms

RESP

Technique: Trans-thoracic impedance

Lead: Options are lead I and II. The default is lead II

Respiration excitation waveform: <300 μA RMS, 62.8 kHz (±10%)

Baseline impedance range: 200 to 2500Ω (using an ECG cable with 1kΩ resistance)

Bandwidth: 0.2 to 2.5 Hz (-3 dB)

Sweep speed

- 6.25 mm/s, 12.5 mm/s or 25 mm/s
- Accuracy: ±10%

Measurement range

- Adult: 0 to 120 rpm
- Pediatric, neonate: 0 to 150 rpm
- Resolution: 1 rpm

Accuracy

- 7 to 150 rpm: ±2 rpm or ±2%, whichever is greater
- 0 to 6 rpm: Not specified

Apnea Alarm Time: 10s, 15s, 20s, 25s, 30s, 35s, 40s

NIBP

Technique: Oscillometry

Mode of operation: Manual, Auto and STAT

Auto mode repetition intervals: 1 min, 2 min, 2.5 min, 3 min, 5 min, 10 min, 15 min, 20 min, 30 min, 1 h, 1.5 h, 2 h, 3 h, 4 h, 8 h

STAT mode cycle time: 5 min

Max measurement time

- Adult, pediatric: 180s
- Neonate: 90s

Measurement ranges (mmHg):

- Systolic; Adult: 25 to 290
- Systolic; Pediatric: 25 to 240
- Systolic; Neonate: 25 to 140
- Diastolic; Adult: 25 to 290
- Diastolic; Pediatric: 25 to 240
- Diastolic; Neonate: 25 to 140
- Mean; Adult: 25 to 290
- Mean; Pediatric: 25 to 240
- Mean; Neonate: 25 to 140

Accuracy

- Max mean error: ±5 mmH
- Max standard deviation: 8 mmHg

Resolution: 1mmHg

TEMP

Technique: Thermal resistance

Measurement range: 0 to 50 °C (32 to 122 °F)

Resolution: 0.1 °C

Accuracy: ±0.1 °C (without probe)

Refreshing rate: 1 s

Minimum time for accurate measurement

- Body surface: <100s
- Body cavity: <80 s

IBP

Technique: Direct invasive measurement

Measurement range: -50 to 300 mmHg

Resolution: 1 mmHg

Accuracy: ±2% or ±1 mmHg, whichever is greater (without sensor)

Refreshing rate: 1s

Measurement range: 0% to 50%

Pressure transducer

- Excitement voltage: 5 VDC, ±2%
- Sensitivity: 5 μV/V/mmHg
- Impedance range: 300 to 3000Ω

CO_2

Measurement mode: Sidestream, microstream, mainstream

Technique: Infrared absorption

PR

PR High: (low limit +2) to 300

PR Low: 15 to (high limit-2)

C.O.

Measurement method: Thermodilution method

Measurement range

- C.O.: 0.1 to 20 L/min
- TB: 23 to 43 °C
- TI: 0 to 27 °C

Resolution

- C.O.: 0.1 L/min
- TB, TI: 0.1 °C

Accuracy

- C.O.: ±5% or ±0.1 L /min, whichever is greater
- TB, TI: ±0.1 °C (without sensor)

Repeatability: C.O. ±2% or ±0.1 L/min, whichever is greater

Alarm range: TB 23 to 43 °C

AG (ANESTHESIA GAS)

Technique: Infrared absorption

Warm-up time

- Iso accuracy mode: ≤ 45s
- Full accuracy mode: ≤ 10min

Sample flow rate

- Adult, pediatric: 120, 150, 200 ml/min
- Neonate: 70, 90, 120 ml/min

Accuracy: ±10 ml/min or ±10%, whichever is greater

Measurement range

CO2: 0 to 30%; O2: 0 to 100%; N2 O: 0 to 100%; Des: 0 to 30%; Sev: 0 to 30%; Enf: 0 to 30%; Iso: 0 to 30%; Hal: 0 to 30%; awRR: 2 to 100 rpm;

Resolution

- CO2: 1 mmHg
- awRR: 1 rpm